



Year 2007



Progress Report of Activities

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Appalachian Plant Materials Center

P. O. Box 390, Alderson, WV 24910 Web site: Plant-Materials.nrcs.usda.gov



Wild Turkey (Meleagris gallopavo) at the Appalachian Plant Materials Center

Who We Are

The Appalachian Plant Materials Center, located in Alderson, West Virginia, serves 11 states in the Appalachian Region from Pennsylvania to Georgia and Alabama. The Center is operated by the USDA-NRCS in cooperation with the USDA-Agriculture Research Service, U.S. Forest Service and the Agriculture Experiment Stations of West Virginia University, Virginia Polytechnic Institute and State University and the University of Kentucky. Alderson is located in the heart of Appalachia, and the Center is situated on County Route 3/29, also known as Old Prison Farm Road, approximately 20 miles Southeast of Lewisburg, West Virginia. This center is new with regard to land resource and physical plant, but is the product of the transfer of programs and equipment from Quicksand, Kentucky to Alderson, West Virginia. The transfer of center functions began in 1996 and was completed in 2000.

What We Do

The Plant Materials Center serves Appalachia by evaluating plants for their ability to solve specific conservation problems related to climate, the rugged topography, soil limitations, various land uses, fish and wildlife needs and desires of the landowners. The center provides a place for conducting systematic observations and evaluations of plants needed to protect our natural resources. New techniques are developed for the propagation, establishment, management and use for new or improved species of grasses, legumes, shrubs and trees.

The Center's program emphasizes improving forage production on hillside pastures, address problems associated with concentrated livestock, reclamation of mined lands, streambank stabilization, agro-forestry, wildlife habitat improvement, and utilization of economic and culturally valuable plants. The center assembles plants from the entire service area with similar soils and climate, evaluates the plants, develops management techniques, and provides seed and plants for planting to test performance throughout the area. Most of the plant materials produced at the center are used in West Virginia, Kentucky, Tennessee, Pennsylvania, Ohio, Virginia, and North Carolina.

A brief summary of year 2007 accomplishments follows. For a complete account of all activities, request the 2007 Technical Report at the above address.

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2007 Summary of Projects

These projects involve one or more species of native plants and have diversified our partnerships with Native Americans, federal agencies and private conservation groups. A brief description of each project follows.

‘Panbowl’ River Alder First Release for the Appalachian PMC

The Appalachian PMC, in conjunction with the Pennsylvania Game Commission, announced the release of ‘Panbowl’ river alder for commercial production in 2007. River alder is a nitrogen-fixing, thicket-forming shrub or small tree with dark, green foliage. It is native to the United States and is suitable for streambank stabilization because of its flexible stems and fibrous root system. River alder reaches mature height of 8-12 feet in 10 years. Seed is produced in small cones and pollen is contributed by birch-like catkins which bloom in mid-to late March. ‘Panbowl’ is the first plant material to be released from the Appalachian PMC for commercial production. This cultivar was selected as superior from a collection of 45 accessions across 13 states. ‘Panbowl’ is named for its origins on the north side of Panbowl Lake in Jackson, Breathitt County, Kentucky.

Cherokee “Winterjon” Apple Propagation

The Eastern Band of the Cherokee Nation requested plant materials assistance through the NRCS Liaison to the Cherokee Nation with development of propagation techniques for *Malus spp.*, or apple, in late 2006. Tribal elders have prioritized black bear (*Ursus americanus*) habitat improvement on the reservation and targeted an indigenous apple to improve late fall and early winter bear food sources.

The Cherokee describe “Winterjon” apple as a small to medium sized very firm fruit that remains attached to the tree and retains its crispness well into the early winter months. They report that black bear have been observed seeking out these apple trees to feed on the fruit well into January and frequently February. These apple trees were once abundant throughout the reservation and black bear were also significantly more numerous.

In order to maintain genetic purity, *Malus spp.* is propagated by grafting. Scion wood was collected from “winterjon” trees identified by the Cherokee in late February 2007. This scion wood was grafted onto MM 9 rootstock obtained from commercial suppliers and planted in 3 gallon containers. Approximately 75% of the grafts were successful and 50 container grown trees were returned to Cherokee, North Carolina for field planting on the reservation in the spring of 2008. Performance of these trees will be monitored annually until they reach fruit bearing age and perhaps longer. Six of the “winterjon” apple trees were retained for monitoring at the PMC and to provide a future scion wood source.

U. S. Department of the Interior-National Park Service Stones River National Battlefield Native Plant Restoration

Stones River National Battlefield, located in Middle Tennessee on the northwestern edge of Murfreesboro is the site of one of the significant battles of the War Between the States. The Battle of Stones River, fought between December 31, 1862 and January 2, 1863 marked the beginning of the Union Army’s “March to the Sea” which resulted in Union control of agricultural land and supply networks and prevented further attempts by the Confederate Army to push northward. Stones River National Battlefield was established in 1927 to preserve this significant historic site. The original property consisted of 344 of the 4,000 acres over which the battle was fought. The park currently encompasses approximately 700 acres.

Vegetation and terrain played an important role in the outcome of the Battle of Stones River. Because of the incidence of limestone outcroppings, cedar brakes and cedar woods dominated the majority of the original park property at the time of the battle. It is suspected that these areas were used as hog lots circa 1862. The cedar glades in the area, which were and are characterized by shallow soil and exposed limestone bedrock, lacked sufficient vegetation for forage or cover for livestock and likely, were considered wastelands.

During the battle, the rock outcrops and thick cedar woods significantly slowed troop progress and impeded rapid movement of artillery pieces. However, the significance of the battlefield's vegetation lies not only in its historical significance but also in its botanical and ecological value. The site is host to a number of rare and endemic plant species and unique plant communities.

Today, introduced and exotic plant species have encroached onto many areas of the battlefield. Park managers have identified restoration of native plant communities as a high priority for maintenance of the parks circa 1862 authenticity. National Park Service personnel have completed a thorough assessment of the vascular flora inhabiting the battlefield property and have targeted approximately twenty native plant species having high priority for use in restoration of plant communities.

The Appalachian Plant Materials Center agreed to work with the National Park Service at Stones River National Battlefield to collect seed, develop propagation techniques, and produce seedling plants and/or seed of the targeted species for plant community restoration within the park.

2003 was the initiation year for this agreement. During 2003, NRCS personnel traveled



Transplanting Plugs at Stones River National Battlefield

to Stones River National Battlefield to become familiar with the park's ecological communities, identify prime seed collection locations for the nineteen species of interest, and to assess appropriate

seed collection techniques and optimum harvest times. Several late summer seed collection trips netted small (less than 0.5 pounds) quantities of seeds from thirteen species. All seed was collected by hand stripping methods. The thirteen species represented in the 2003 seed harvest were: *Andropogon virginicus*, *Andropogon ternarius*, *Andropogon gyrans*, *Chasmanthium latifolium*, *Dichanthelium spp.*, *Eragrostis spectabilis*, *Leersia virginica*, *Schizachyrium scoparium*, *Asclepias tuberosa*, *Symphyotrichum drummondii*, *Lespedeza violacea*, *Lespedeza hirta*, and *Rudbeckia triloba*. All seed harvested was transported to the Appalachian Plant Materials Center, where it was conditioned and placed in appropriate seed storage until planting in fiscal year 2004.

In 2004, the Appalachian Plant Materials Center produced approximately 20,000 seedlings from the 2003 seed harvest. The seedlings were mechanically transplanted into tilled fields at Stones River National Battlefield to establish seed production fields. Natural Resources staff at Stones River National Battlefield will harvest and use seed from these fields to restore and maintain this historic site's circa 1862 floristic authenticity.

Seed collection and conditioning and transplant production continued in 2007. The PMC produced a total of about 26,000 transplants representing 10 plus native species. The majority of the transplants were shipped to Stones River National Battlefield for establishment of seed production fields. Transplants retained by the PMC are to be used to establish small seed production blocks at the PMC in the event of field failures at Murfreesboro.

US Army Corps. of Engineers – Marmet Native Plant Mitigation

The Appalachian Plant Materials Center continued to assist the US Army Corps. of Engineers - Huntington District with restoration of native plants at the Marmet Locks and Dam Project. This project is located on the Kanawha River in West Virginia upstream of Charleston. The project includes building a new lock chamber and approach channels at River Mile 67.7. All vegetation and habitats within the approximately 150 acre site will be destroyed during the course of construction.

Six native woody species were harvested from the site prior to the start of construction. These species are: *Acer saccharinum*, silver maple; *Lindera benzoin*, spicebush; *Sambucus canadensis*, elderberry; *Asimina triloba*, pawpaw; *Sassafras albidum*, sassafras; and *Aesculus octandra*, yellow buckeye. These plants are being maintained as container grown stock at the Plant Materials Center until completion of construction, when they will be re-introduced to the Marmet site to assist with re-establishment of genetic diversity at the lock and dam location. In the autumn of 2005, 128 pawpaws, 104 elderberries, 10 sassafras, 100 spice bushes and 38 silver maples were returned to the construction site for transplanting into areas where earth moving activities have been completed. Plants remaining at the PMC continue to be maintained as container stock pending construction completion circa 2009.

Saving West Virginia's Balsam Fir

Abies balsamea, balsam fir is native to high elevation areas in West Virginia. However, balsam fir numbers are declining due to a serious infestation of the balsam wooly adelgid. The adelgid is an exotic, sap-sucking insect that causes mortality within 2-3 years of initial contact. Several conservation groups have recognized the rapid decline of the fir in West Virginia and have formed a partnership with the US Department of the Interior and the Plant Materials Center to restore balsam fir to four natural areas in the West Virginia Highlands. Volunteers from the West Virginia Highlands Conservancy, The Mountain Institute, The Nature Conservancy, and others harvested balsam fir seed from four locations in the West Virginia Highlands in the fall of 2000. The harvested seed was processed by the volunteers and shipped to the Appalachian PMC for seed banking. The PMC is also responsible for producing seedlings for reintroduction to the natural areas where the seed was harvested.



Abies balsamea seedling production at Alderson Plant Materials Center

During 2003, staff at the Appalachian Plant Materials Center germinated a small lot of seed from each of the four collection locations. While actual germination percentages were low, 20-35 percent, for all lots, several hundred seedlings were produced. These seedlings will be maintained at the Plant Materials Center until they are large enough to be re-introduced into their native habitat. The seedlings from 2003 were maintained at the PMC during 2004 and additional small quantities of seed from each collection were germinated in 2004, with the 2004 germination percentages being similar to 2003 percentages. Approximately 400 seedlings were returned to the Canaan Valley Wildlife Refuge in 2005 and 2006. The PMC continues to maintain the remaining seedlings until they are reintroduced into their native habitat.

Giant Cane Rapid Propagation Study

Arundinaria gigantea, giant cane or bamboo is our largest native grass. Giant cane covered extensive areas of the southeastern United States at the time of European settlement. These areas were known as canebrakes and they disappeared rapidly following settlement due to a combination of factors. Today, giant cane persists largely as an understory plant in other vegetative cover types.

The shoots or canes arise from underground stems known as rhizomes. Only rarely does *Arundinaria* flower and set seed. Historical accounts of cane brakes clearly indicate that when *Arundinaria* flowers and produces seed, the plant then dies. Thus the principal method of reproduction is vegetative.

The NRCS has developed an interest in rapidly propagating giant cane for use as a streambank erosion control plant and other conservation uses. Collection of plants from Illinois, Indiana and Ohio were initiated in 2001. The Appalachian PMC received plants from 9 different locations. These plants will be evaluated with regard to survival, rate of spread, and ability to produce new plants from division of rhizomes.



Arundinaria gigantea stand near Malden, WV

The Eastern Band of the Cherokee Nation also has an interest in giant cane. However, their interest is in those cane plants that produce large diameter canes. Cherokee crafters use the large diameter canes to make traditional basketry. Suitable canes have become very difficult to harvest from wild cane populations, and the Cherokee are interested in propagating plants that are suitable for their basketry. The Appalachian PMC will assist the Cherokee with development of propagation and management techniques to ensure their crafters have a dependable supply of large diameter cane plants.

In 2004, the Appalachian Plant Materials Center continued to maintain and observe the 9 collections from Illinois, Indiana and Ohio. Collections of giant cane from the remainder of the Center service area continue to be sought, especially from stands that are producing larger diameter canes.

Two collections from West Virginia were added to the *Arundinaria* observation block in 2005. An *Arundinaria* plant establishment study was also initiated in 2005 using the eleven accessions currently maintained at the PMC. This study was evaluated and determined to be a total failure in 2006. The PMC plans to repeat the study circa 2008.

Central Appalachian White Clover Germplasm Characterization Study

The Plant Materials Center is cooperating with Dr. Paul Voigt, retired Agricultural Research Service clover breeder, to provide white clover base populations that could be used in future cultivar germplasm development projects. To obtain white clover germplasm with good adaptation to central Appalachian pastures, Dr. Voigt made collections from well managed pastures located in Kentucky, Ohio, West Virginia, and Virginia. Twelve white clover experimental populations and cultivars have been planted in an observation block at the Plant Materials Center. Data collection began in 2003, and is expected to continue through at least 2007.



Central Appalachian White Clover Observation Block

Data collected included leaf size, foliage height, stolon spread, stolon density, flower density, and pest damage.

In 2004, Dr. Voigt was able to determine that three of the Central Appalachian White Clover populations deserve consideration for germplasm preservation and possible release. These populations all exhibit good adaptation to Central Appalachian environments and presumably to Appalachian pastures. Two other Central Appalachian White Clover populations were not included in this study. They were planted in a new study established in 2004. Data collection on the study established in 2004 continued throughout 2005, 2006 and 2007.

One or more white clover germplasm releases are anticipated circa 2010.

Annual Land Judging Competition Held at the Plant Materials Center

The Plant Materials Center was the host location for the Southern and Greenbrier Soil Conservation District sponsored Regional Land Judging competition again in 2007. This marks the eighth year that the PMC has hosted this annual competition.



Regional Land Judging Competition Scene

Competitors are normally Future Farmer of America and Canon Envirothon students from middle and high schools from the seven counties comprising the two soil conservation districts. Students and coaches are given a brief tour of the center after they have completed their judging. The Plant Materials Center looks forward to hosting this competition in future years.

West Virginia National Guard Camp Dawson Native Grasses Project

During 2004, the Natural Resources Staff at Camp Dawson, the Army National Guard Training Camp near Kingwood, West Virginia, entered into an agreement with the Appalachian PMC. The purpose of this agreement is for the PMC to produce local ecotype warm season grass seed for the Camp Dawson Natural Resources Staff to use in revegetating areas disturbed by annual training activities. Much of the training conducted at the camp involves earthmoving equipment, which inevitably leaves a lot of bare ground to be revegetated! Previous revegetation efforts have

focused almost exclusively on use of introduced grasses and/or legumes which have often proven to be less than satisfactory aesthetic, wildlife and erosion control values. It is the desire of the Camp's Natural Resource Staff to increase use of locally adapted warm season grasses to improve the aesthetic, wildlife, and erosion control values of their revegetation efforts.

Four warm season species are indigenous to the Camp. These species are: *Sorghastrum nutans*, Indiangrass; *Andropogon gerardii*, big bluestem; *Schizachyrium scoparium*, little bluestem; and *Panicum virgatum*, switchgrass. Seed from each of these species was collected at Camp Dawson in 2004 and 2005. These seeds were conditioned at the PMC and planted to establish seed production blocks at the PMC in 2006. Seed harvested from the PMC production fields will be returned to Camp Dawson to be used in revegetating areas disturbed by troop training exercises. All four species will also be evaluated at the PMC as potential Central Appalachian ecotype releases for use as forage and wildlife values.

Native Plants for Kentucky Food Security Act Programs

The Kentucky Plant Materials Committee is going native! FSA contracts benefiting wildlife are abundant in Kentucky, while locally adapted native plants to use in these contracts are not. The Kentucky Plant Materials Committee approached the PMC for assistance with this dilemma in 2004. As a result, the PMC will be doing initial seed increase for five native species in 2005. These species are: *Liatris spicata*, Spiked Blazing Star; *Rudbeckia hirta*, Black-eyed Susan; *Desmanthus illinoensis*; Illinois bundleflower; *Lespedeza capitata*, Roundhead lespedeza; and *Lespedeza virginicus*, Virginia lespedeza. Seed produced by the PMC will be provided to Kentucky seed producers who will establish production fields and market seed of these species in Kentucky. All of these species are potential Kentucky ecotype releases.

Seedlings of each Kentucky ecotype were started in 2.25 inch diameter plug cells in 2005. These plugs were transplanted into field production blocks in 2006. The first seed harvest from these production

blocks was in the fall of 2007. Seed will be made available for field plantings in 2008.

Canaan Valley Wildlife Refuge Ecotype Speckled Alder Project

Canaan Valley National Wildlife Refuge, the nation's 500th, is located near Davis, WV at an altitude of approximately 3500 feet. The combination of altitude, wet soils, forests, shrub lands, and open expanses create a sub alpine landscape and provide a diversity of wildlife habitats. While not as readily visible as other birds, woodcock contribute to the diversity of avian species that inhabit the refuge.

USF&WS personnel at Canaan Valley Wildlife Refuge have secured funding for habitat enhancement projects within the refuge, with a primary focus on woodcock habitat. Personnel have also harvested seed from locally available *Alnus incana* ssp. *rugosa*, speckled alder, plants for use in producing seedlings for habitat restoration and enhancement within the refuge. However, USF&WS lack the personnel, facilities and expertise to produce seedlings for their woodcock habitat restoration and enhancement project.

Thus, US F & WS personnel opted to solicit PMC assistance with production of the speckled alder seedlings. The PMC agreed to produce approximately 1000 seedlings for the Canaan Valley Wildlife Refuge woodcock habitat enhancement program and proceeded to plant the speckled alder seeds provided by the US F&WS in the autumn of 2005. This project will continue through 2008.

American Chestnut Blight Resistance Evaluations

American chestnut was once a dominant tree in Appalachian forests until the species was decimated by *Endothia parasitica* (chestnut blight). The American Chestnut Cooperators Foundation (ACCF) is dedicated to conducting chestnut selection and breeding research to improve resistance to chestnut blight. A large part of the ACCF research is conducted through field plantings

throughout the natural range of the species to evaluate selected strains. The ACCF approached the NRCS in 2006 for assistance with establishment of a chestnut nursery and evaluation plantings of their improved strains for long term evaluation purposes.

Native plants for high quality wildlife habitat is identified as a high priority need in the PMC Long Range Plan. The PMC recognizes that the American chestnut was once an environmentally and culturally dominant part of the Appalachian landscape, the geographic area which the PMC serves. Also, the PMC has some limited experience with chestnut blight resistance research using seedlings produced from irradiated seed. Cooperating with the ACCF enables the PMC to resume American chestnut blight resistance research and address a high priority need identified in the PMC's Long Range Plan.

The PMC received chestnuts of approximately 20 accessions from the ACCF in 2006. These seeds were planted in the PMC's woody plant nursery where seed germination was monitored. All seedlings produced were lifted in the spring of 2007 and distributed to cooperators to establish long term field evaluation plantings.

Cover Crop Evaluation Project

The NRCS in West Virginia assists farmers to reduce erosion, improve nutrient management, protect soil quality, and encourages the use of integrated pest management on cropland. NRCS has committed technical and financial assistance for vegetable producers to meet these goals through development of voluntary conservation plans and accelerated application using Farm Bill programs. A critical element of these plans is to insure correct timing and accepted methods of cover crops to achieve the land nutrient balance, minimize the loss of nutrients to ground or surface water, improve irrigation water management, and to improve soil quality. As a research and teaching institute, the West Virginia University Cooperative Extension Service (WVU CES) has a long term commitment with NRCS, Conservation Districts and farmers to bring research and technology to the agriculture community.

During 2007, the Appalachian PMC, in conjunction with the West Virginia NRCS and Cooperative Extension Service, continued an evaluation project for various winter cover crops on cropland. The final products of this project will be seasonal field trials of NRCS released cultivars and commercially available cover crops, publication of technical reports and recommendations for cover crops used in vegetable production, and seasonal in-field training of NRCS and WVU CES staff based on results of the demonstrations. This project is expected to continue through at least 2008.